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said optical fiber feed means feeds said optical fiber stocked in said optical fiber path which successively draws out said optical fiber.

3. (Three Times Amended) An optical fiber wiring apparatus in accordance with claim 1, wherein

at least said lead end of said wheel-less wiring head has a hemispherical shape and the guide groove guides said optical fiber to the hemispherical part,

said pressure groove is formed in said hemispherical part, and

said optical fiber is guided to the lead end of said wheel-less wiring head via said guide groove and said pressure groove.

5. (Amended) An optical fiber wiring apparatus in accordance with claim 2, wherein

said optical fiber feed means is provided with a deflection detection means for detecting deflection of said optical fiber within said optical fiber path of said wheel-less wiring head or in a path leading to this optical fiber path, and

a deflection maintaining means for maintaining the deflection within a predetermined range based on detection values of said deflection detection means.

6. (Amended) An optical fiber wiring apparatus in accordance with claim 1, wherein

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said optical fiber feed means feeds an amount of optical fiber necessary during various successively executed wirings successively into the optical fiber path of said wheel-less wiring head.

9. (Amended) An optical fiber wiring apparatus in accordance with claim 1, wherein

said optical fiber contacting means is provided with a Z axis actuator which displaces said wheel-less wiring head in a Z axial direction, and displaces said wheel-less wiring head in the direction of said wiring substrate and brings said optical fiber at the lead end of said wheel-less wiring head into contact with said wiring substrate.

10. (Twice Amended) An optical fiber wiring apparatus in accordance with claim 9, wherein the predetermined pressure with which said optical fiber pressing means presses said optical fiber at said lead end of said wheel-less wiring head against said wiring substrate is within a range of  $9.8 \times 10^{-2}$  (N) (10 gf) - 2.0 N (200 gf).

11. (Amended) An optical fiber wiring apparatus in accordance with claim 1 wherein

at least a part within said optical fiber path of said wheel-less wiring head which comes into contact with said optical fiber comprises a material having a lower coefficient of friction than said optical fiber.

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12. Canceled

13. (Amended) An optical fiber wiring apparatus in accordance with claim 3,  
wherein

a Z axial rotation means, which rotates said wheel-less wiring head about the Z axis  
in accordance with a wiring pattern, and orients said pressure groove of said wheel-less  
wiring head in a direction in which wiring is to be conducted during the wiring operation,  
is provided.

14. (Amended) An optical fiber wiring apparatus in accordance with claim 13,  
wherein

said Z axial rotation means is provided with a rotational reference sensor for  
orienting said pressure groove of said wheel-less wiring head in the direction in which  
wiring is to be conducted.

16. (Amended) An optical fiber wiring apparatus in accordance with claim 15,  
wherein

said optical fiber cutting means is provided with:

said optical fiber path into which said optical fiber is inserted,

a cutter disposed so as to be capable of movement in a direction crossing said  
optical fiber path, and

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an electromagnetic slider which moves said cutter instantaneously in a direction crossing said optical fiber path.

17. (Amended) An optical fiber wiring apparatus in accordance with claim 1, wherein

said XY movement means moves said wheel-less wiring head and wiring substrate relative to one another so that said wheel-less wiring head is positioned outside said wiring substrate;

said optical fiber feed means feeds a predetermined length of said optical fiber when said wheel-less wiring head is positioned outside said wiring substrate, and

by means of this, a predetermined length of optical fiber is fed outside said wiring substrate.

19. (Twice Amended) An optical fiber wiring apparatus which lays optical fibers down on a wiring substrate, comprising:

a manipulator which is disposed in a plane which is approximately parallel to the surface of said wiring substrate in a movable manner, and which conducts the laying operation of the optical fibers on said wiring substrate, the manipulator comprising:

an optical fiber feed means for feeding an optical fiber;

a wheel-less wiring mechanism for wiring, onto said wiring substrate, said optical fiber fed by said optical fiber feed means, wherein the wiring mechanism includes an

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optical fiber pressing means for pressing said optical fiber against said wiring substrate with a predetermined pressure;

a Z axial rotation mechanism which rotates about an axis approximately perpendicular to the surface of said wiring substrate and thereby changes the orientation of the wiring of said wiring mechanism; and

an optical fiber cutting means which cuts said optical fiber fed by said optical fiber feed means wherein in the wheel-less wiring mechanism, a pressure groove is formed with a radius of curvature larger than the radius of curvature at which said optical fiber breaks, so as to support the optical fiber in a state in which it is bent by a fixed amount and is pressed onto said wiring substrate.

21. (Twice Amended) A wiring method which conducts the wiring of an optical fiber onto a wiring substrate, comprising:

adjusting the feeding of the optical fiber by an optical fiber feed means so that the tension on the optical fiber is within a fixed range;

wiring the optical fiber fed by the optical fiber feed means onto the wiring substrate by a wheel-less wiring mechanism while the optical fiber is guided along a guide groove formed in the wiring mechanism and is pressed against the wiring substrate with a predetermined pressure; and

cutting the optical fiber to a required length for the wiring by an optical fiber cutting means wherein the step of wiring the optical fiber includes supporting said optical fiber with a radius of curvature larger than the radius of curvature at which said optical fiber

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breaks, in a state in which said optical fiber is bent by a fixed amount and is pressed onto said wiring substrate.

22. (Three Times Amended) An optical fiber wiring method which employs an optical fiber wiring apparatus which is provided with a wiring substrate, a wheel-less wiring head which has a guide groove along which an optical fiber is guided, and applies the optical fiber to said wiring substrate with a predetermined pressure, and an optical fiber feed means which feeds stocked optical fiber, which apparatus moves said wiring substrate and said wheel-less wiring head relative to one another in the XY directions and conducts wiring operations which form a desired optical fiber wiring pattern on said wiring substrate, comprising;

feeding an optical fiber of predetermined length by said optical fiber feeding means, in a manner unrelated to the wiring, either before or after the wiring operation or both before and after the wiring operation, and thereby producing an optical wiring board having optical fibers of a predetermined length connected to said wiring pattern either before or after said wiring pattern by means of the wiring operation or both before and after said wiring pattern wherein the wiring operation includes supporting said optical fiber with a radius of curvature larger than the radius of curvature at which said optical fiber breaks, in a state in which said optical fiber is bent by a fixed amount and is pressed onto said wiring substrate.

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23. (Four Times Amended) An optical fiber wiring method which employs an optical fiber wiring apparatus which is provided with a wiring substrate, a wheel-less wiring head which is provided with an optical fiber path which guides an optical fiber to a lead end thereof and which applies said optical fiber guided to said lead end to said wiring substrate with a predetermined pressure, and an optical fiber feeding means which feeds stocked optical fiber, which apparatus moves said wiring substrate and said wheel-less wiring head relative to one another in the XY directions and conducts a wiring operation which forms a predetermined optical fiber wiring pattern on said wiring substrate, comprising:

at the initiation of wiring, moving said wheel-less wiring head to a wiring initiation position, and

in the state in which said optical fiber has been guided to said lead end of said wheel-less wiring head along a guide groove formed in the wheel-less wiring head, pressing said optical fiber against said wiring substrate with said predetermined pressure,

wherein said wheel-less wiring head is moved along said wiring pattern with respect to said wiring substrate, the required optical fiber is fed into said optical fiber path of said wheel-less wiring head by said optical fiber feeding means, and wiring is conducted; and

wherein the step of pressing the optical fiber against said wiring substrate includes supporting said optical fiber with a radius of curvature at which said optical fiber breaks, in a state in which said optical fiber is bent by a fixed amount and is pressed onto said wiring substrate.

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24. (Three Times Amended) An optical fiber wiring method in which an optical fiber is laid on a wiring substrate by a wheel-less wiring head, at least a lead end of which is formed with a curved surface, which has formed in a side surface part thereof a guide groove which guides said optical fiber to said spherical surface part, and which has a pressure groove which extends from said guide groove to the bottom part of said spherical surface part, comprising;

at the initiation of wiring, moving said wheel-less wiring head to a wiring initiation position:

fitting an optical fiber into said pressure groove;

pressing the optical fiber against said wiring substrate with a predetermined pressure; and

moving said wheel-less wiring head along said wiring pattern with respect to said wiring substrate to thereby conduct said wiring wherein the step of pressing the optical fiber against said wiring substrate includes supporting said optical fiber via said pressure groove with a radius of curvature larger than the radius of curvature at which said optical fiber breaks, in a state which said optical fiber is bent by a fixed amount and is pressed onto said wiring substrate.

25. (Amended) An optical fiber wiring method in accordance with claim 24, wherein

when a wiring pattern to be wired is a curved pattern, said pressure groove of said wheel-less wiring head is oriented in a direction at tangent to said wiring pattern.